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## TRACKING DATA EVALUATION REPORT FOR STS-119 and ISS

**Daily Period: Mar 17 at 224051 GMT through Mar 18 at 231025 GMT**  
**Mission Period: Mar 14 at 000000 GMT through Mar 18 at 231025 GMT**

### **1. EXECUTIVE SUMMARY**

This report summarizes all GN and SN tracking data for ISS and STS (except for ISS one-way Doppler data) since the beginning of mission support for STS-119. The executive summary of this report provides a daily overview of the number of passes received for ISS and STS as well as a daily summary of significant tracking data anomalies. The remainder of this report provides a detailed cumulative mission summary of all GN and SN tracking data for ISS and STS.

The C-band tracking support for ISS started on March 14, 2009. STS-119 was launched on March 15, 2009 at 234344 GMT. STS-119 docked with ISS on March 17 at 212000 GMT.

Twelve STS C-band passes from EAFF, FRCF, WL2F, and WLPQ were received during the daily reporting period. All of the STS C-band passes during the daily reporting period had nominal angle and range tracking data.

Five 1-way STS S-band passes from AGO3, MIL3, and MILA were received during the daily reporting period. All of the 1-way STS S-band passes during the daily reporting period had nominal angle tracking data.

The cumulative mission percentages of anomalous SN TDRS-3, TDRS-4, TDRS-5, TDRS-6, and TDRS-10 tracking data for STS-119 are 1.8, 2.5, 2.6, 0.8, and 3.0 respectively. The anomalous SN tracking data has consisted of various Doppler drifts, biases, and/or spikes.

***No significant tracking data problems were noted for ISS or STS-119 during the daily reporting period.***

## **2. INTRODUCTION**

This memorandum, which is produced by the Metric Tracking Data Evaluation (MTDE) Task located within the Flight Dynamics Facility (FDF) at Goddard Space Flight Center (GSFC), provides a Ground Network (GN) and Space Network (SN) tracking data evaluation report for the Space Transportation System (STS) and for the International Space Station (ISS). This report includes information about data processing, network validation, and network calibration for STS and ISS missions.

## **3. DATA PROCESSING**

The metric tracking data evaluated for this report was processed using the Goddard Trajectory Determination System (GTDS), which is the primary orbit determination system used by the FDF. This system produces Observed minus Computed (O-C) values by comparing actual tracker measurements with computed measurements derived from weighted least-squares orbital solutions. Orbital solutions for ISS are derived by using 24 hours of C-band range tracking data as well as SN two-way range and Doppler tracking data if available. Orbital solutions for STS are derived by using one revolution (approximately 96 minutes) of SN two-way Doppler tracking data, GN S-band range and two-way range-rate tracking data, and C-band range tracking data.

## **4. NETWORK VALIDATION**

The validation of metric tracking data is the process of determining the quality of tracking data measurements received from the trackers. The output from the GTDS orbital solutions is evaluated to assess the accuracy and usefulness of the tracking data. The O-C values (also known as residuals) and the amount of data edited from the orbital solutions (a 3-sigma edit criterion is normally used) are statistically analyzed to identify data anomalies and to assess the overall network tracking performance. Tracking data anomalies are identified and noted in this report. Anomalous tracking data as well as tracking data that is flagged invalid by the tracker is generally not used for orbit determination.

## **5. NETWORK CALIBRATION**

The calibration of metric tracking data is the process of using statistical evaluation techniques to determine tracker and network performance. Anomalous tracking data as well as tracking data that is flagged invalid by the tracker is generally not used for network calibration. Calibration parameters for each tracker, which are computed from the GTDS calibration O-C statistics for each pass, are defined as follows:

Tracker Mean: A weighted sample mean of pass O-C means. The tracker mean is an estimate of the bias in the measurements.

Deviation: A weighted 2-sigma sample standard deviation (SD) of pass O-C means about the tracker mean. A Student's t correction for small sample size is applied when necessary. If there are fewer than four passes for a tracker, the deviation is not computed. The deviation is a measure of the bias consistency.

Average Pass SD: A weighted Root Mean Square (rms) of pass O-C standard deviations. This parameter provides an upper limit for the average pass system noise.

Root Sum Square: The Root Sum Square (rss) of the tracker mean, half the deviation, and the average pass SD. This parameter is an estimate of the average measurement error. The rss is not computed if there are fewer than four passes for a tracker.

All of these statistical parameters are weighted by the number of points in each pass.

## **6. GN TRACKING DATA EVALUATION CRITERIA**

GN S-band tracking data for STS is comprised of x-angle, y-angle, range and range-rate tracking data. GN C-band tracking data for STS and ISS is comprised of azimuth angle, elevation angle, and range tracking data.

S-band and C-band GN tracking data taken below 7° in elevation is not used for orbit determination or for network calibration. Poor quality x-angle or azimuth angle tracking data taken in antenna keyhole regions (where the absolute value of the y-angle is greater than or equal to 70° for X-Y antennas or the absolute value of the elevation angle is greater than or equal to 70° for Az-EI antennas) is not considered anomalous. Tracking data received during periods of antenna masking is excluded from the tracker calibration statistics and is not considered anomalous.

S-band GN angle tracking data is generally considered to be anomalous if more than 20 percent of the data flagged valid has residuals greater than or equal to 0.05°. C-band GN angle tracking data is generally considered to be anomalous if more than 20 percent of the angle data flagged valid has residuals greater than or equal to 0.10°. S-band GN range tracking data is generally considered to be anomalous if more than 20 percent of the data flagged valid has residuals greater than or equal to 20 meters. C-band GN range tracking data is generally considered to be anomalous if more than 20 percent of the data flagged valid has residuals greater than or equal to 50 meters. S-band 2-way GN range-rate tracking data is generally considered to be anomalous if more than 20 percent of the data flagged valid has residuals greater than or equal to greater than 0.5 meters per second.

Occasionally a C-band tracker will track the wrong target vehicle when STS and ISS are in very close proximity to each other. This pass will be identified in the FDF reports with the name of the intended target vehicle. If no usable tracking data is received from the intended target vehicle, then this pass will be identified as an anomalous pass.

## **7. SN TRACKING DATA EVALUATION CRITERIA**

SN tracking data for ISS is comprised of one-way S-band and K-band Doppler tracking data. Only the one-way S-band Doppler tracking data is used in the orbit determination process for ISS. The ISS one-way S-band Doppler tracking data residuals, which measure the offset from the nominal frequency of the ISS transponder, are generally considered nominal as long as the residuals are less than 700 Hertz. Reports are generated by the FDF on a weekly and monthly basis that summarize the frequency offset for the ISS transponders. If the frequency offset exceeds 700 Hertz, FDF personnel will issue a report recommending an adjustment to the forward and transmit frequencies for ISS.

If 2-way SN tracking of ISS is available, then the FDF will use the coherent range and Doppler tracking data as well as C-band tracking data for orbit determination purposes.

SN tracking data for STS is comprised of two-way S-band Doppler tracking data. The Doppler tracking data for STS is used for determining the quality of the tracking service. Each Doppler tracking data observation is evaluated and categorized as usable, as anomalous, or as invalid. An invalid observation is one that has been flagged as invalid in the tracking data message (TDM) at White Sands Complex (WSC). Each tracking data event is rated as a success or as a failure. A success is a tracking data event that has at least 70 percent usable Doppler tracking data. A failure is an event that has less than 70 percent usable Doppler data.

## **8. GN TRACKING DATA PASSES**

The following table lists the number of daily and mission S-band and C-band passes received from each tracker for both ISS and STS having a maximum elevation of at least 7°. Only passes with a maximum elevation of at least 7° are used by the FDF for orbit determination and anomaly reporting. The number of passes listed in this table may not agree with the actual number of passes scheduled.

Tracker	ISS		STS-119	
	Daily	Mission	Daily	Mission
AGO3	0	0	2	5
ANTQ	0	3	0	1
ASCQ	0	6	0	1
EAFF	0	6	2	3
FRCF	0	7	3	8
KMRF	0	0	0	1
MIL3	0	0	1	6
MILA	0	0	3	3
WL2F	0	10	5	8
WLPQ	0	5	1	6
<b>TOTALS</b>	<b>0</b>	<b>37</b>	<b>17</b>	<b>42</b>

## **9. GN TRACKING DATA ANOMALIES**

The following table contains a chronological listing of all GN tracking data anomalies for both ISS and STS for the entire mission. Tracking data anomalies are only reported for passes having a maximum elevation above 7°. Tracking data in the keyhole region or tracking data affected by station masking is not considered anomalous.

<b>Start</b>	<b>Stop</b>	<b>Tracker</b>	<b>Satellite</b>	<b>Comments</b>

## **10. GN STATISTICS**

The following report provides GN tracking data residual statistics for both ISS and STS. Statistics, consisting of mean, standard deviation and number of points, are computed for each pass for angle, range, and range-rate tracking data residuals. The statistics are summarized for each tracking station for each satellite. The statistics are computed for two different time intervals. The first time interval corresponds to the tracking data summarized on a daily basis. The second time interval corresponds to the tracking data summarized for the entire mission. Group statistics, consisting of mean, deviation, average pass standard deviation, and rss, are also computed for each tracker for both ISS and STS.

### **FLIGHT DYNAMICS FACILITY GN STATISTICS PROGRAM**

20090317/224051 = START TIME FOR STATISTICS INTERVAL 1  
20090318/231018 = STOP TIME FOR STATISTICS INTERVAL 1

20090314/000000 = START TIME FOR STATISTICS INTERVAL 2  
20090318/231018 = STOP TIME FOR STATISTICS INTERVAL 2

### **LO SPEED TRACKING DATA**

N = INCLUDE TT&C DATA (Y/N)

SATELLITE(S)  
ISS  
STS-119

STATION(S)  
ALL

### **STATISTICS INTERVAL 1**

STATION = AGO3 SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)				ANGLE 2 RESIDUALS (DEG)				RANGE RESIDUALS (M)				RANGE-RATE RESIDUALS (M/S)			
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090318/172810	20090318/173750	0.042	0.014	34	100.0	-0.019	0.010	34	100.0	-----	-----	0	0.0	-----	----- 0 0.0 1
20090318/190410	20090318/191350	-0.009	0.016	22	100.0	-0.008	0.016	28	100.0	-----	-----	0	0.0	-----	----- 0 0.0 1

STATION = AGO3 SATELLITE = STS-119

RESIDUALS								VDNA NOISE				RATING				
MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY				
ANGLE 1 (DEG)	0.022	-----	0.015	-----	56	2	0.0086	0.0111	0.0099	2	2	100.0				
ANGLE 2 (DEG)	-0.014	-----	0.013	-----	62	2	0.0068	0.0087	0.0078	2	2	100.0				
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	2	0.0				
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	2	0.0				

STATION = AGO3 SATELLITE = STS-119 SUMMARY

STATION = EAFF SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)				
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C		
20090318/010354	20090318/011506	0.007	0.009	59 100.0	-0.003	0.008	59 100.0	9.899	25.224	59	89.8	-----	-----	-----	-----	0	0.0	0	
20090318/104054	20090318/104954	0.013	0.015	5 100.0	0.000	0.006	5 100.0	-19.822	11.403	5	100.0	-----	-----	-----	-----	0	0.0	0	

STATION = EAFF SATELLITE = STS-119

RESIDUALS					VDNA NOISE					RATING				
MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY		
ANGLE 1 (DEG)	0.007	-----	0.010	-----	64	2	0.0048	0.0062	0.0049	2	2	100.0		
ANGLE 2 (DEG)	-0.003	-----	0.008	-----	64	2	0.0029	0.0031	0.0031	2	2	100.0		
RANGE (M)	7.577	-----	24.568	-----	64	2	12.3091	15.3513	15.2475	2	2	90.6		
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	2	0.0		

STATION = EAFF SATELLITE = STS-119 SUMMARY

STATION = FRCF SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)				
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C		
20090318/023900	20090318/025024	-0.004	0.006	61 100.0	-0.006	0.013	61 100.0	-1.497	18.899	61	100.0	-----	-----	-----	-----	0	0.0	0	
20090318/072942	20090318/073930	-0.000	0.008	26 100.0	0.005	0.025	26 96.2	6.504	14.340	26	100.0	-----	-----	-----	-----	0	0.0	0	
20090318/090442	20090318/091624	-0.002	0.007	67 100.0	0.002	0.007	67 100.0	10.162	20.151	67	95.5	-----	-----	-----	-----	0	0.0	0	

STATION = FRCF SATELLITE = STS-119

RESIDUALS					VDNA NOISE					RATING				
MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY		
ANGLE 1 (DEG)	-0.002	-----	0.007	-----	154	3	0.0026	0.0063	0.0037	3	3	100.0		
ANGLE 2 (DEG)	-0.001	-----	0.014	-----	154	3	0.0034	0.0124	0.0067	3	3	99.4		
RANGE (M)	4.926	-----	18.800	-----	154	3	7.9663	14.5848	12.1803	3	3	98.1		
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0		

STATION = FRCF SATELLITE = STS-119 SUMMARY

STATION = MIL3 SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)				ANGLE 2 RESIDUALS (DEG)				RANGE RESIDUALS (M)				RANGE-RATE RESIDUALS (M/S)			
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090317/233400	20090317/234520	-0.004	0.014	21	100.0	-0.033	0.016	31	83.9	-----	-----	0	0.0	-----	0 0.0 1

STATION = MIL3 SATELLITE = STS-119

RESIDUALS

VDNA NOISE

RATING

	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	-0.004	-----	0.014	-----	21	1	0.0152	0.0152	0.0152	1	1	100.0	
ANGLE 2 (DEG)	-0.033	-----	0.016	-----	31	1	0.0085	0.0085	0.0085	1	1	83.9	
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0	

STATION = MIL3 SATELLITE = STS-119 SUMMARY

STATION = MILA SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)

MEAN	SD	PTS	%USE A
20090318/060300	0.019	0.016	12 100.0
20090318/073700	-0.005	0.012	26 100.0
20090318/222500	0.016	0.017	41 100.0

ANGLE 2 RESIDUALS (DEG)

RANGE RESIDUALS (M)

RANGE-RATE RESIDUALS (M/S)

MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090318/060300	0.019	0.016	12 100.0	-0.009	0.010	12 100.0	-----	0	0.0	-----	0 0.0 1
20090318/073700	-0.005	0.012	26 100.0	0.000	0.008	26 100.0	-----	0	0.0	-----	0 0.0 1
20090318/222500	0.016	0.017	41 100.0	-0.011	0.006	41 100.0	-----	0	0.0	-----	0 0.0 1

STATION = MILA SATELLITE = STS-119

RESIDUALS

VDNA NOISE

RATING

	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.010	-----	0.015	-----	79	3	0.0067	0.0082	0.0077	3	3	100.0	
ANGLE 2 (DEG)	-0.007	-----	0.007	-----	79	3	0.0043	0.0102	0.0064	3	3	100.0	
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	

STATION = MILA SATELLITE = STS-119 SUMMARY

STATION = WL2F SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)

MEAN	SD	PTS	%USE A
20090317/233524	-0.001	0.010	68 100.0
20090318/011206	0.004	0.016	39 100.0
20090318/042506	0.000	0.016	41 100.0
20090318/060024	-0.003	0.011	68 100.0
20090318/073612	0.007	0.021	25 100.0

ANGLE 2 RESIDUALS (DEG)

RANGE RESIDUALS (M)

RANGE-RATE RESIDUALS (M/S)

MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090317/233524	-0.007	0.009	68 100.0	8.110	15.498	68 100.0	-----	0	0.0	0	0.0 0
20090318/011206	-0.009	0.015	39 100.0	4.719	15.558	39 100.0	-----	0	0.0	0	0.0 0
20090318/042506	-0.005	0.016	41 100.0	-0.602	10.682	41 100.0	-----	0	0.0	0	0.0 0
20090318/060024	-0.007	0.014	68 100.0	3.131	16.975	68 100.0	-----	0	0.0	0	0.0 0
20090318/073612	-0.004	0.018	25 100.0	0.916	15.662	25 100.0	-----	0	0.0	0	0.0 0

STATION = WL2F SATELLITE = STS-119

## RESIDUALS

## VDNA NOISE

## RATING

	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.000	0.010	0.014	0.015	241	5	0.0053	0.0168	0.0104	5	5	100.0	
ANGLE 2 (DEG)	-0.007	0.005	0.014	0.016	241	5	0.0033	0.0118	0.0079	5	5	100.0	
RANGE (M)	3.928	9.640	15.273	16.490	241	5	7.4650	10.4371	9.0515	5	5	100.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	5	0.0	

STATION = WL2F SATELLITE = STS-119 SUMMARY

STATION = WLPQ SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)				ANGLE 2 RESIDUALS (DEG)				RANGE RESIDUALS (M)				RANGE-RATE RESIDUALS (M/S)					
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C		
20090318/222700	20090318/224036	-0.000	0.003	66	100.0	0.005	0.004	66	100.0	7.969	25.323	66	89.4	-----	0	0.0	0

STATION = WLPQ SATELLITE = STS-119

RESIDUALS						VDNA NOISE						RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY				
ANGLE 1 (DEG)	0.000	-----	0.003	-----	66	1	0.0015	0.0015	0.0015	1	1	100.0					
ANGLE 2 (DEG)	0.005	-----	0.004	-----	66	1	0.0008	0.0008	0.0008	1	1	100.0					
RANGE (M)	7.969	-----	25.323	-----	66	1	11.3043	11.3043	11.3043	1	1	89.4					
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0					

STATION = WLPQ SATELLITE = STS-119 SUMMARY

## COMBINED STATISTICS FOR EACH STATION

STATION = AGO3  
SATELLITE = STS-119

RESIDUALS						VDNA NOISE						RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY				
ANGLE 1 (DEG)	0.022	-----	0.015	-----	56	2	0.0086	0.0111	0.0099	2	2	100.0					
ANGLE 2 (DEG)	-0.014	-----	0.013	-----	62	2	0.0068	0.0087	0.0078	2	2	100.0					
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	2	0.0					
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	2	0.0					

COMBINED STATISTICS SUMMARY FOR AGO3

STATION = EAFF  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.007	-----	0.010	-----	64	2	0.0048	0.0062	0.0049	2	2	100.0	
ANGLE 2 (DEG)	-0.003	-----	0.008	-----	64	2	0.0029	0.0031	0.0031	2	2	100.0	
RANGE (M)	7.577	-----	24.568	-----	64	2	12.3091	15.3513	15.2475	2	2	90.6	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	2	0.0	

COMBINED STATISTICS SUMMARY FOR EAFF

STATION = FRCF  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	-0.002	-----	0.007	-----	154	3	0.0026	0.0063	0.0037	3	3	100.0	
ANGLE 2 (DEG)	-0.001	-----	0.014	-----	154	3	0.0034	0.0124	0.0067	3	3	99.4	
RANGE (M)	4.926	-----	18.800	-----	154	3	7.9663	14.5848	12.1803	3	3	98.1	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	

COMBINED STATISTICS SUMMARY FOR FRCF

STATION = MIL3  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	-0.004	-----	0.014	-----	21	1	0.0152	0.0152	0.0152	1	1	100.0	
ANGLE 2 (DEG)	-0.033	-----	0.016	-----	31	1	0.0085	0.0085	0.0085	1	1	83.9	
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0	

COMBINED STATISTICS SUMMARY FOR MIL3

STATION = MILA  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
ANGLE 2 (DEG)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
RANGE (M)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
RANGE-RATE (M/S)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.010	-----	0.015	-----	79	3	0.0067	0.0082	0.0077	3	3	100.0	
ANGLE 2 (DEG)	-0.007	-----	0.007	-----	79	3	0.0043	0.0102	0.0064	3	3	100.0	
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	

COMBINED STATISTICS SUMMARY FOR MILA

STATION = WL2F  
SATELLITE = STS-119

	RESIDUALS						VDNA NOISE						RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY					
ANGLE 1 (DEG)	0.000	0.010	0.014	0.015	241	5	0.0053	0.0168	0.0104	5	5	100.0						
ANGLE 2 (DEG)	-0.007	0.005	0.014	0.016	241	5	0.0033	0.0118	0.0079	5	5	100.0						
RANGE (M)	3.928	9.640	15.273	16.490	241	5	7.4650	10.4371	9.0515	5	5	100.0						
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	5	0.0						

COMBINED STATISTICS SUMMARY FOR WL2F

STATION = WLPQ  
SATELLITE = STS-119

	RESIDUALS						VDNA NOISE						RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY					
ANGLE 1 (DEG)	0.000	-----	0.003	-----	66	1	0.0015	0.0015	0.0015	1	1	100.0						
ANGLE 2 (DEG)	0.005	-----	0.004	-----	66	1	0.0008	0.0008	0.0008	1	1	100.0						
RANGE (M)	7.969	-----	25.323	-----	66	1	11.3043	11.3043	11.3043	1	1	89.4						
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0						

COMBINED STATISTICS SUMMARY FOR WLPQ

STATISTICS INTERVAL 2

STATION = AGO3 SATELLITE = STS-119

	ANGLE 1 RESIDUALS (DEG)				ANGLE 2 RESIDUALS (DEG)				RANGE RESIDUALS (M)				RANGE-RATE RESIDUALS (M/S)			
	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090316/184240 20090316/185030	0.031	0.013	31	100.0	-0.014	0.007	31	100.0	-----	-----	0	0.0	-----	-----	0	0.0 1
20090317/170330 20090317/170950	0.066	0.011	8	100.0	-0.028	0.011	16	100.0	-----	-----	0	0.0	-----	-----	0	0.0 1

20090317/183600	20090317/185140	0.040	0.034	42	90.5	-0.017	0.010	42	100.0	-----	-----	0	0.0	-----	-----	0	0.0	1
20090318/172810	20090318/173750	0.042	0.014	34	100.0	-0.019	0.010	34	100.0	-----	-----	0	0.0	-----	-----	0	0.0	1
20090318/190410	20090318/191350	-0.009	0.016	22	100.0	-0.008	0.016	28	100.0	-----	-----	0	0.0	-----	-----	0	0.0	1

STATION = AGO3 SATELLITE = STS-119

	RESIDUALS					VDNA NOISE					RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY			
ANGLE 1 (DEG)	0.032	0.061	0.022	0.049	137	5	0.0029	0.0111	0.0077	5	5	97.1				
ANGLE 2 (DEG)	-0.016	0.017	0.011	0.021	151	5	0.0031	0.0087	0.0062	5	5	100.0				
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	5	0.0				
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	5	0.0				

STATION = AGO3 SATELLITE = STS-119 SUMMARY

STATION = ANTQ SATELLITE = ISS	ANGLE 1 RESIDUALS (DEG)	ANGLE 2 RESIDUALS (DEG)	RANGE RESIDUALS (M)	RANGE-RATE RESIDUALS (M/S)														
	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C		
20090315/210306	20090315/211554	0.004	0.003	58	100.0	-0.004	0.006	58	100.0	-1.885	6.326	58	100.0	-----	-----	0	0.0	0
20090315/223848	20090315/225036	0.005	0.002	41	100.0	-0.003	0.005	41	100.0	-2.425	8.166	41	100.0	-----	-----	0	0.0	0
20090317/202342	20090317/203448	0.001	0.003	62	100.0	-0.008	0.004	62	100.0	-2.423	21.014	62	100.0	-----	-----	0	0.0	0

STATION = ANTQ SATELLITE = ISS

	RESIDUALS					VDNA NOISE					RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY			
ANGLE 1 (DEG)	0.003	-----	0.003	-----	161	3	0.0012	0.0014	0.0013	3	3	100.0				
ANGLE 2 (DEG)	-0.005	-----	0.005	-----	161	3	0.0013	0.0057	0.0040	3	3	100.0				
RANGE (M)	-2.230	-----	14.206	-----	161	3	4.5078	8.6083	6.1131	3	3	100.0				
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0				

STATION = ANTQ SATELLITE = ISS SUMMARY

STATION = ANTQ SATELLITE = STS-119	ANGLE 1 RESIDUALS (DEG)	ANGLE 2 RESIDUALS (DEG)	RANGE RESIDUALS (M)	RANGE-RATE RESIDUALS (M/S)														
	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C		
20090317/220012	20090317/220924	0.005	0.002	31	100.0	-0.001	0.008	31	100.0	4.080	6.238	31	100.0	-----	-----	0	0.0	0

STATION = ANTQ SATELLITE = STS-119

	RESIDUALS					VDNA NOISE					RATING					
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY			
ANGLE 1 (DEG)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
ANGLE 2 (DEG)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
RANGE (M)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	
RANGE-RATE (M/S)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	

ANGLE 1 (DEG)	0.005	-----	0.002	-----	31	1	0.0008	0.0008	0.0008	1	1	100.0
ANGLE 2 (DEG)	-0.001	-----	0.008	-----	31	1	0.0040	0.0040	0.0040	1	1	100.0
RANGE (M)	4.080	-----	6.238	-----	31	1	2.5367	2.5367	2.5367	1	1	100.0
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0

STATION = ANTQ SATELLITE = STS-119 SUMMARY

STATION = ASCQ SATELLITE = ISS	ANGLE 1 RESIDUALS (DEG)				ANGLE 2 RESIDUALS (DEG)				RANGE RESIDUALS (M)				RANGE-RATE RESIDUALS (M/S)			
	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090315/162100 20090315/163148	0.002	0.005	41	100.0	0.010	0.006	41	100.0	3.803	14.491	41	100.0	-----	-----	-----	0 0.0 0
20090315/175618 20090315/180736	-0.001	0.005	51	100.0	0.010	0.006	51	100.0	5.682	17.247	51	98.0	-----	-----	-----	0 0.0 0
20090316/164730 20090316/170000	0.001	0.004	65	100.0	0.002	0.004	69	100.0	9.381	10.478	69	100.0	-----	-----	-----	0 0.0 0
20090317/055206 20090317/060324	-0.000	0.002	64	100.0	0.007	0.005	64	100.0	6.270	15.406	64	100.0	-----	-----	-----	0 0.0 0
20090317/154006 20090317/155148	0.003	0.004	50	100.0	-0.003	0.007	50	100.0	6.611	17.052	50	98.0	-----	-----	-----	0 0.0 0
20090317/171506 20090317/172606	-0.000	0.005	48	100.0	0.012	0.008	48	100.0	1.674	14.318	48	100.0	-----	-----	-----	0 0.0 0

STATION = ASCQ SATELLITE = ISS

STATION = ASCQ SATELLITE = ISS	RESIDUALS					VDNA NOISE					RATING				
	MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY	MEAN	SD	PTS
ANGLE 1 (DEG)	0.001	0.004	0.004	0.005	319 6	0.0004	0.0037	0.0025	6	6	100.0	-----	-----	-----	0 0.0 0
ANGLE 2 (DEG)	0.006	0.014	0.006	0.011	323 6	0.0004	0.0043	0.0029	6	6	100.0	-----	-----	-----	0 0.0 0
RANGE (M)	5.898	6.849	14.815	16.309	323 6	7.6611	17.6598	13.6348	6	6	99.4	-----	-----	-----	0 0.0 0
RANGE-RATE (M/S)	-----	-----	-----	-----	0 0	-----	-----	-----	0	6	0.0	-----	-----	-----	0 0.0 0

STATION = ASCQ SATELLITE = ISS SUMMARY

STATION = ASCQ SATELLITE = STS-119	ANGLE 1 RESIDUALS (DEG)				ANGLE 2 RESIDUALS (DEG)				RANGE RESIDUALS (M)				RANGE-RATE RESIDUALS (M/S)			
	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M ANOMALY C
20090316/172206 20090316/173218	0.001	0.005	47	100.0	0.013	0.005	47	100.0	-3.518	10.507	47	100.0	-----	-----	-----	0 0.0 0

STATION = ASCQ SATELLITE = STS-119

STATION = ASCQ SATELLITE = STS-119	RESIDUALS					VDNA NOISE					RATING				
	MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY	MEAN	SD	PTS
ANGLE 1 (DEG)	0.001	-----	0.005	-----	47 1	0.0018	0.0018	0.0018	1	1	100.0	-----	-----	-----	0 0.0 0
ANGLE 2 (DEG)	0.013	-----	0.005	-----	47 1	0.0012	0.0012	0.0012	1	1	100.0	-----	-----	-----	0 0.0 0
RANGE (M)	-3.518	-----	10.507	-----	47 1	5.1062	5.1062	5.1062	1	1	100.0	-----	-----	-----	0 0.0 0
RANGE-RATE (M/S)	-----	-----	-----	-----	0 0	-----	-----	-----	0	1	0.0	-----	-----	-----	0 0.0 0

STATION = ASCQ SATELLITE = STS-119 SUMMARY

STATION = EAFF SATELLITE = ISS

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)					
MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A	M	ANOMALY C
20090316/014512	20090316/015600	0.006	0.009	54 100.0	-0.000	0.006	54 100.0		-1.350	23.546	54	98.1		-----	-----	-----	-----	0	0.0 0	
20090316/031954	20090316/033130	0.000	0.006	63 100.0	-0.005	0.011	63 100.0		1.078	17.255	63	98.4		-----	-----	-----	-----	0	0.0 0	
20090316/094554	20090316/095730	-0.001	0.006	67 100.0	-0.004	0.007	67 100.0		5.283	19.621	66	97.0		-----	-----	-----	-----	0	0.0 0	
20090316/112142	20090316/113106	0.003	0.011	29 100.0	-0.000	0.006	29 100.0		8.596	18.289	29	100.0		-----	-----	-----	-----	0	0.0 0	
20090317/021130	20090317/022330	-0.005	0.015	62 100.0	-0.003	0.008	68 100.0		0.889	16.182	68	98.5		-----	-----	-----	-----	0	0.0 0	
20090317/083742	20090317/084842	-0.004	0.008	55 100.0	-0.004	0.009	55 100.0		12.229	24.073	55	90.9		-----	-----	-----	-----	0	0.0 0	

STATION = EAFF SATELLITE = ISS

RESIDUALS					VDNA NOISE					RATING							
MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY	MEAN	SD	PTS	%USE A	M	ANOMALY C
ANGLE 1 (DEG)	-0.001	0.011	0.010	0.011 330 6	0.0050	0.0113	0.0071	6	6	100.0		-----	-----	-----	-----	0	0.0 0
ANGLE 2 (DEG)	-0.003	0.005	0.008	0.009 336 6	0.0049	0.0063	0.0055	6	6	100.0		-----	-----	-----	-----	0	0.0 0
RANGE (M)	3.958	13.045	19.960	21.368 335 6	12.6056	19.2360	15.8974	6	6	97.0		-----	-----	-----	-----	0	0.0 0
RANGE-RATE (M/S)	-----	-----	-----	----- 0 0	-----	-----	-----	0	0	-----	-----	-----	-----	-----	-----	0	0.0 0

STATION = EAFF SATELLITE = ISS SUMMARY

STATION = EAFF SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)					
MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A	M	ANOMALY C
20090317/102300	20090317/103212	0.002	0.008	41 100.0	0.000	0.010	41 100.0		4.919	8.572	41	100.0		-----	-----	-----	-----	0	0.0 0	
20090318/010354	20090318/011506	0.007	0.009	59 100.0	-0.003	0.008	59 100.0		9.899	25.224	59	89.8		-----	-----	-----	-----	0	0.0 0	
20090318/104054	20090318/104954	0.013	0.015	5 100.0	0.000	0.006	5 100.0		-19.822	11.403	5	100.0		-----	-----	-----	-----	0	0.0 0	

STATION = EAFF SATELLITE = STS-119

RESIDUALS					VDNA NOISE					RATING							
MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY	MEAN	SD	PTS	%USE A	M	ANOMALY C
ANGLE 1 (DEG)	0.005	-----	0.009	----- 105 3	0.0048	0.0062	0.0054	3	3	100.0		-----	-----	-----	-----	0	0.0 0
ANGLE 2 (DEG)	-0.002	-----	0.009	----- 105 3	0.0029	0.0064	0.0047	3	3	100.0		-----	-----	-----	-----	0	0.0 0
RANGE (M)	6.539	-----	19.892	----- 105 3	4.8630	15.3513	12.4666	3	3	94.3		-----	-----	-----	-----	0	0.0 0
RANGE-RATE (M/S)	-----	-----	-----	----- 0 0	-----	-----	-----	0	0	-----	-----	-----	-----	-----	-----	0	0.0 0

STATION = EAFF SATELLITE = STS-119 SUMMARY

STATION = FRCF SATELLITE = ISS

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)						
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C
20090315/025224	20090315/030424	-0.007	0.009	68	100.0	0.002	0.008	68	100.0	0.596	13.666	68	98.5	-----	-----	-----	-----	0	0.0	0	
20090315/042848	20090315/043924	-0.009	0.007	43	100.0	-0.008	0.010	43	100.0	4.110	21.786	43	100.0	-----	-----	-----	-----	0	0.0	0	
20090315/091854	20090315/092936	-0.003	0.010	52	100.0	0.003	0.014	52	100.0	7.250	23.588	52	96.2	-----	-----	-----	-----	0	0.0	0	
20090315/105354	20090315/110530	-0.002	0.008	65	100.0	0.006	0.010	65	100.0	2.510	18.589	65	98.5	-----	-----	-----	-----	0	0.0	0	
20090316/081100	20090316/082018	-0.000	0.009	17	100.0	-0.004	0.015	17	100.0	4.725	20.383	17	100.0	-----	-----	-----	-----	0	0.0	0	
20090317/034800	20090317/035818	-0.008	0.011	39	100.0	-0.016	0.016	39	100.0	11.056	23.055	39	97.4	-----	-----	-----	-----	0	0.0	0	
20090317/101254	20090317/102424	0.001	0.007	63	100.0	0.002	0.010	63	100.0	-5.726	24.086	63	96.8	-----	-----	-----	-----	0	0.0	0	

STATION = FRCF SATELLITE = ISS

RESIDUALS					VDNA NOISE					RATING				
MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY			
ANGLE 1 (DEG)	-0.004	0.009	0.009	0.011	347	7	0.0044	0.0115	0.0065	7	7	100.0		
ANGLE 2 (DEG)	-0.001	0.018	0.011	0.015	347	7	0.0064	0.0142	0.0100	7	7	100.0		
RANGE (M)	2.617	13.256	20.705	21.897	347	7	12.8557	23.6165	17.8628	7	7	98.0		
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	7	0.0		

STATION = FRCF SATELLITE = ISS SUMMARY

STATION = FRCF SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)						
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C
20090316/024224	20090316/025118	-0.002	0.006	39	100.0	0.005	0.006	41	100.0	1.453	9.421	41	100.0	-----	-----	-----	-----	0	0.0	0	
20090316/085800	20090316/090724	-0.006	0.008	31	100.0	0.002	0.011	31	100.0	4.330	8.320	31	100.0	-----	-----	-----	-----	0	0.0	0	
20090316/103100	20090316/104042	0.001	0.010	48	100.0	0.002	0.013	48	100.0	0.920	10.759	47	97.9	-----	-----	-----	-----	0	0.0	0	
20090317/023212	20090317/024254	-0.009	0.012	55	100.0	-0.006	0.018	55	100.0	5.542	11.876	55	100.0	-----	-----	-----	-----	0	0.0	0	
20090317/084954	20090317/085912	-0.006	0.009	41	100.0	0.002	0.015	41	100.0	-4.942	10.719	41	100.0	-----	-----	-----	-----	0	0.0	0	
20090318/023900	20090318/025024	-0.004	0.006	61	100.0	-0.006	0.013	61	100.0	-1.497	18.899	61	100.0	-----	-----	-----	-----	0	0.0	0	
20090318/072942	20090318/073930	-0.000	0.008	26	100.0	0.005	0.025	26	96.2	6.504	14.340	26	100.0	-----	-----	-----	-----	0	0.0	0	
20090318/090442	20090318/091624	-0.002	0.007	67	100.0	0.002	0.007	67	100.0	10.162	20.151	67	95.5	-----	-----	-----	-----	0	0.0	0	

STATION = FRCF SATELLITE = STS-119

RESIDUALS					VDNA NOISE					RATING				
MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY			
ANGLE 1 (DEG)	-0.004	0.008	0.008	0.010	368	8	0.0026	0.0063	0.0043	8	8	100.0		
ANGLE 2 (DEG)	0.000	0.011	0.014	0.015	370	8	0.0034	0.0124	0.0071	8	8	99.7		
RANGE (M)	2.975	11.982	14.561	16.023	369	8	3.5909	14.5848	9.0468	8	8	98.9		
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	8	0.0		

STATION = FRCF SATELLITE = STS-119 SUMMARY

STATION = KMRF SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)						ANGLE 2 RESIDUALS (DEG)						RANGE RESIDUALS (M)						RANGE-RATE RESIDUALS (M/S)					
	MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A	M	ANOMALY C		
20090317/162712	20090317/163842	0.002	0.015	52	100.0	-0.022	0.039	52	96.2	-0.080	7.033	52	100.0	-	-	-	-	-	0	0.0			

STATION = KMRF SATELLITE = STS-119

RESIDUALS						VDNA NOISE						RATING							
	MEAN	DEV	SD	RSS	PTS	PASSES		MIN	MAX	RMS	PASSES	TOTALPASSES		%USE	ANOMALY				
ANGLE 1 (DEG)	0.002	-----	0.015	-----	52	1	0.0118	0.0118	0.0118	1	1	1	100.0						
ANGLE 2 (DEG)	-0.022	-----	0.039	-----	52	1	0.0195	0.0195	0.0195	1	1	1	96.2						
RANGE (M)	-0.080	-----	7.033	-----	52	1	4.3301	4.3301	4.3301	1	1	1	100.0						
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	0	1	0.0						

STATION = KMRF SATELLITE = STS-119 SUMMARY

STATION = MIL3 SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)						ANGLE 2 RESIDUALS (DEG)						RANGE RESIDUALS (M)						RANGE-RATE RESIDUALS (M/S)					
	MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A	M	ANOMALY C		
20090316/073300	20090316/074300	0.021	0.008	10	100.0	-0.008	0.006	14	100.0	-	-	-	0	0.0	-	-	-	-	0	0.0			
20090316/090620	20090316/091420	0.012	0.009	7	100.0	0.007	0.005	7	100.0	-	-	-	0	0.0	-	-	-	-	0	0.0			
20090316/233210	20090316/234300	0.010	0.026	25	96.0	-0.010	0.013	25	96.0	-	-	-	0	0.0	-	-	-	-	0	0.0			
20090317/072440	20090317/073430	0.010	0.017	14	100.0	-0.005	0.006	15	100.0	-	-	-	0	0.0	-	-	-	-	0	0.0			
20090317/215200	20090317/221000	-0.021	0.020	17	76.5	-0.040	0.022	20	85.0	-	-	-	0	0.0	-	-	-	-	0	0.0			
20090317/233400	20090317/234520	-0.004	0.014	21	100.0	-0.033	0.016	31	83.9	-	-	-	0	0.0	-	-	-	-	0	0.0			

STATION = MIL3 SATELLITE = STS-119

RESIDUALS						VDNA NOISE						RATING							
	MEAN	DEV	SD	RSS	PTS	PASSES		MIN	MAX	RMS	PASSES	TOTALPASSES		%USE	ANOMALY				
ANGLE 1 (DEG)	0.003	0.037	0.019	0.027	94	6	0.0058	0.0152	0.0114	6	6	6	94.7						
ANGLE 2 (DEG)	-0.020	0.043	0.014	0.033	112	6	0.0023	0.0085	0.0061	6	6	6	92.0						
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	0	6	0.0						
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	0	6	0.0						

STATION = MIL3 SATELLITE = STS-119 SUMMARY

STATION = MILA SATELLITE = STS-119

ANGLE 1 RESIDUALS (DEG)						ANGLE 2 RESIDUALS (DEG)						RANGE RESIDUALS (M)						RANGE-RATE RESIDUALS (M/S)					
	MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A		MEAN	SD	PTS	%USE A	M	ANOMALY C		

		MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C
20090318/060300	20090318/061140	0.019	0.016	12	100.0	-0.009	0.010	12	100.0	-----	-----	0	0.0	-----	-----	0	0.0	1	
20090318/073700	20090318/074840	-0.005	0.012	26	100.0	0.000	0.008	26	100.0	-----	-----	0	0.0	-----	-----	0	0.0	1	
20090318/222500	20090318/223730	0.016	0.017	41	100.0	-0.011	0.006	41	100.0	-----	-----	0	0.0	-----	-----	0	0.0	1	

STATION = MILA SATELLITE = STS-119

	RESIDUALS					VDNA NOISE					RATING						
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY				
ANGLE 1 (DEG)	0.010	-----	0.015	-----	79	3	0.0067	0.0082	0.0077	3	3	100.0					
ANGLE 2 (DEG)	-0.007	-----	0.007	-----	79	3	0.0043	0.0102	0.0064	3	3	100.0					
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0					
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0					

STATION = MILA SATELLITE = STS-119 SUMMARY

STATION = WL2F SATELLITE = ISS

	ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)				
	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C		
20090314/234942	20090314/235954	0.005	0.010	61	100.0	0.009	0.009	61	100.0	10.487	12.620	61	100.0	-----	-----	0	0.0	0		
20090315/012454	20090315/013718	0.000	0.015	60	100.0	-0.004	0.013	60	100.0	-3.406	10.030	60	100.0	-----	-----	0	0.0	0		
20090315/030206	20090315/031242	0.003	0.018	13	100.0	-0.006	0.021	13	100.0	-10.562	17.840	13	100.0	-----	-----	0	0.0	0		
20090315/061424	20090315/062618	-0.000	0.011	56	100.0	0.003	0.014	56	100.0	3.476	17.412	56	100.0	-----	-----	0	0.0	0		
20090315/074936	20090315/080136	0.002	0.011	65	100.0	0.001	0.013	65	100.0	4.507	13.689	65	100.0	-----	-----	0	0.0	0		
20090315/224206	20090315/225242	0.009	0.016	20	100.0	0.017	0.016	20	100.0	1.383	15.336	20	100.0	-----	-----	0	0.0	0		
20090316/230824	20090316/231948	0.004	0.010	63	100.0	0.005	0.013	63	100.0	-3.008	11.670	63	100.0	-----	-----	0	0.0	0		
20090317/004354	20090317/005512	0.003	0.012	60	100.0	-0.007	0.014	60	100.0	11.418	14.172	60	100.0	-----	-----	0	0.0	0		
20090317/053324	20090317/054518	0.003	0.014	57	100.0	0.004	0.016	57	100.0	11.027	10.640	57	100.0	-----	-----	0	0.0	0		
20090317/070824	20090317/072036	0.005	0.018	64	100.0	0.001	0.016	64	100.0	-4.904	13.268	64	100.0	-----	-----	0	0.0	0		

STATION = WL2F SATELLITE = ISS

	RESIDUALS					VDNA NOISE					RATING						
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY				
ANGLE 1 (DEG)	0.003	0.005	0.013	0.014	519	10	0.0080	0.0226	0.0118	10	10	100.0					
ANGLE 2 (DEG)	0.002	0.013	0.014	0.016	519	10	0.0078	0.0221	0.0118	10	10	100.0					
RANGE (M)	3.128	15.760	13.310	15.781	519	10	9.4647	16.5704	11.4652	10	10	100.0					
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	10	0.0					

STATION = WL2F SATELLITE = ISS SUMMARY

STATION = WL2F SATELLITE = STS-119

	ANGLE 1 RESIDUALS (DEG)	ANGLE 2 RESIDUALS (DEG)	RANGE RESIDUALS (M)	RANGE-RATE RESIDUALS (M/S)
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	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	M	ANOMALY C
20090316/233342	20090316/234424	0.004	0.011	50	100.0	0.012	0.014	50	100.0	-0.159	6.687	50	100.0	-----	-----	0	0.0	0
20090317/010812	20090317/011718	0.004	0.012	32	100.0	-0.007	0.016	32	100.0	1.083	6.906	32	100.0	-----	-----	0	0.0	0
20090317/220100	20090317/221206	0.009	0.016	35	100.0	0.010	0.014	35	100.0	1.725	8.088	35	100.0	-----	-----	0	0.0	0
20090317/233524	20090317/234836	-0.001	0.010	68	100.0	-0.007	0.009	68	100.0	8.110	15.498	68	100.0	-----	-----	0	0.0	0
20090318/011206	20090318/012300	0.004	0.016	39	100.0	-0.009	0.015	39	100.0	4.719	15.558	39	100.0	-----	-----	0	0.0	0
20090318/042506	20090318/043642	0.000	0.016	41	100.0	-0.005	0.016	41	100.0	-0.602	10.682	41	100.0	-----	-----	0	0.0	0
20090318/060024	20090318/061224	-0.003	0.011	68	100.0	-0.007	0.014	68	100.0	3.131	16.975	68	100.0	-----	-----	0	0.0	0
20090318/073612	20090318/074706	0.007	0.021	25	100.0	-0.004	0.018	25	100.0	0.916	15.662	25	100.0	-----	-----	0	0.0	0

STATION = WL2F SATELLITE = STS-119

RESIDUALS					VDNA NOISE					RATING							
MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY	MEAN	SD	PTS	%USE A M	ANOMALY C	
ANGLE 1 (DEG)	0.002	0.010	0.014	0.015	358	8	0.0053	0.0168	0.0095	8	8	100.0	-----	-----	0	0.0	0
ANGLE 2 (DEG)	-0.002	0.020	0.014	0.017	358	8	0.0033	0.0154	0.0090	8	8	100.0	-----	-----	0	0.0	0
RANGE (M)	2.888	7.561	13.195	14.027	358	8	2.9716	10.4371	7.8423	8	8	100.0	-----	-----	0	0.0	0
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	8	0.0	-----	-----	0	0.0	0

STATION = WL2F SATELLITE = STS-119 SUMMARY

STATION = WLPQ SATELLITE = ISS

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)				
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M	ANOMALY C			
20090316/001624	20090316/002924	-0.000	0.005	66	100.0	0.005	0.005	69	100.0	2.886	13.354	69	100.0	-----	-----	0	0.0	0	
20090316/015600	20090316/020412	-0.003	0.003	42	100.0	0.010	0.004	42	100.0	-5.968	12.674	42	97.6	-----	-----	0	0.0	0	
20090316/050612	20090316/051736	-0.001	0.003	36	100.0	0.014	0.003	36	100.0	-4.332	10.425	36	100.0	-----	-----	0	0.0	0	
20090316/064118	20090316/065412	0.001	0.006	67	100.0	0.010	0.003	67	100.0	1.735	16.194	67	98.5	-----	-----	0	0.0	0	
20090316/081718	20090316/082848	-0.002	0.003	37	100.0	0.007	0.003	37	100.0	1.163	14.953	37	100.0	-----	-----	0	0.0	0	

STATION = WLPQ SATELLITE = ISS SUMMARY

RESIDUALS					VDNA NOISE					RATING							
MEAN	DEV	SD	RSS	PTS PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY	MEAN	SD	PTS	%USE A M	ANOMALY C	
ANGLE 1 (DEG)	-0.001	0.004	0.005	0.005	248	5	0.0021	0.0031	0.0026	5	5	100.0	-----	-----	0	0.0	0
ANGLE 2 (DEG)	0.009	0.009	0.004	0.011	251	5	0.0013	0.0031	0.0021	5	5	100.0	-----	-----	0	0.0	0
RANGE (M)	-0.192	10.710	13.950	14.944	251	5	10.6116	13.9374	12.0236	5	5	99.2	-----	-----	0	0.0	0
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	5	0.0	-----	-----	0	0.0	0

STATION = WLPQ SATELLITE = ISS SUMMARY

ANGLE 1 RESIDUALS (DEG)					ANGLE 2 RESIDUALS (DEG)					RANGE RESIDUALS (M)					RANGE-RATE RESIDUALS (M/S)				
MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M	ANOMALY C			
STATION = WLPQ SATELLITE = STS-119	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----			

		MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A	MEAN	SD	PTS	%USE A M	ANOMALY C
20090316/011818	20090316/012724	-0.002	0.002	24	100.0	0.010	0.004	24	100.0	-10.883	10.150	24	100.0	-----	-----	-----	0	0.0 0
20090316/055836	20090316/060900	-0.001	0.004	39	100.0	0.010	0.003	39	100.0	-0.382	5.159	39	100.0	-----	-----	-----	0	0.0 0
20090316/073118	20090316/074218	-0.000	0.003	48	100.0	0.004	0.003	48	100.0	-0.023	8.919	48	100.0	-----	-----	-----	0	0.0 0
20090317/054942	20090317/060012	-0.001	0.004	46	100.0	0.011	0.003	46	100.0	-1.623	6.849	46	100.0	-----	-----	-----	0	0.0 0
20090317/072300	20090317/073300	-0.002	0.004	41	100.0	0.003	0.002	41	100.0	-3.232	7.367	41	100.0	-----	-----	-----	0	0.0 0
20090318/222700	20090318/224036	-0.000	0.003	66	100.0	0.005	0.004	66	100.0	7.969	25.323	66	89.4	-----	-----	-----	0	0.0 0

STATION = WLPQ SATELLITE = STS-119

#### RESIDUALS

	MEAN	DEV	SD	RSS	PTS	PASSES
ANGLE 1 (DEG)	-0.001	0.002	0.003	0.004	264	6
ANGLE 2 (DEG)	0.007	0.009	0.003	0.009	264	6
RANGE (M)	0.158	15.094	14.344	16.209	264	6
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0

#### VDNA NOISE

	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
	0.0008	0.0020	0.0016	6	6	100.0	
	0.0008	0.0019	0.0013	6	6	100.0	
	2.0693	11.3043	6.3300	6	6	97.3	
	-----	-----	-----	0	6	0.0	

#### RATING

STATION = WLPQ SATELLITE = STS-119 SUMMARY

#### COMBINED STATISTICS FOR EACH STATION

STATION = AGO3

SATELLITE = STS-119

#### RESIDUALS

	MEAN	DEV	SD	RSS	PTS	PASSES
ANGLE 1 (DEG)	0.032	0.061	0.022	0.049	137	5
ANGLE 2 (DEG)	-0.016	0.017	0.011	0.021	151	5
RANGE (M)	-----	-----	-----	-----	0	0
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0

#### VDNA NOISE

	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
	0.0029	0.0111	0.0077	5	5	97.1	
	0.0031	0.0087	0.0062	5	5	100.0	
	-----	-----	-----	0	5	0.0	
	-----	-----	-----	0	5	0.0	

#### RATING

COMBINED STATISTICS SUMMARY FOR AGO3

STATION = ANTO

SATELLITE = ISS

SATELLITE = STS-119

#### RESIDUALS

	MEAN	DEV	SD	RSS	PTS	PASSES
ANGLE 1 (DEG)	0.003	0.006	0.003	0.005	192	4
ANGLE 2 (DEG)	-0.005	0.009	0.006	0.009	192	4

#### VDNA NOISE

	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
	0.0008	0.0014	0.0012	4	4	100.0	
	0.0013	0.0057	0.0040	4	4	100.0	

#### RATING

RANGE (M)	-1.211	8.575	13.259	13.988	192	4	2.5367	8.6083	5.7689	4	4	100.0
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	4	0.0

COMBINED STATISTICS SUMMARY FOR ANTO

STATION = ASCQ  
 SATELLITE = ISS  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.001	0.003	0.004	0.005	366	7	0.0004	0.0037	0.0025	7	7	100.0	
ANGLE 2 (DEG)	0.007	0.014	0.006	0.011	370	7	0.0004	0.0043	0.0028	7	7	100.0	
RANGE (M)	4.702	10.235	14.341	15.936	370	7	5.1062	17.6598	12.9102	7	7	99.5	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	7	0.0	

COMBINED STATISTICS SUMMARY FOR ASCQ

STATION = EAFF  
 SATELLITE = ISS  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.001	0.011	0.009	0.011	435	9	0.0048	0.0113	0.0067	9	9	100.0	
ANGLE 2 (DEG)	-0.003	0.004	0.008	0.009	441	9	0.0029	0.0064	0.0054	9	9	100.0	
RANGE (M)	4.574	12.756	19.944	21.433	440	9	4.8630	19.2360	15.2444	9	9	96.4	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	9	0.0	

COMBINED STATISTICS SUMMARY FOR EAFF

STATION = FRCF  
 SATELLITE = ISS  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	-0.004	0.007	0.009	0.010	715	15	0.0026	0.0115	0.0056	15	15	100.0	
ANGLE 2 (DEG)	-0.000	0.013	0.013	0.014	717	15	0.0034	0.0142	0.0088	15	15	99.9	
RANGE (M)	2.802	10.831	17.807	18.822	716	15	3.5909	23.6165	14.3027	15	15	98.5	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	15	0.0	

COMBINED STATISTICS SUMMARY FOR FRCF

STATION = KMRF  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.002	-----	0.015	-----	52	1	0.0118	0.0118	0.0118	1	1	100.0	
ANGLE 2 (DEG)	-0.022	-----	0.039	-----	52	1	0.0195	0.0195	0.0195	1	1	96.2	
RANGE (M)	-0.080	-----	7.033	-----	52	1	4.3301	4.3301	4.3301	1	1	100.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	1	0.0	

COMBINED STATISTICS SUMMARY FOR KMRF

STATION = MIL3  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.003	0.037	0.019	0.027	94	6	0.0058	0.0152	0.0114	6	6	94.7	
ANGLE 2 (DEG)	-0.020	0.043	0.014	0.033	112	6	0.0023	0.0085	0.0061	6	6	92.0	
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	6	0.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	6	0.0	

COMBINED STATISTICS SUMMARY FOR MIL3

STATION = MILA  
 SATELLITE = STS-119

	RESIDUALS				VDNA NOISE				RATING				
	MEAN	DEV	SD	RSS	PTS	PASSES	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.010	-----	0.015	-----	79	3	0.0067	0.0082	0.0077	3	3	100.0	
ANGLE 2 (DEG)	-0.007	-----	0.007	-----	79	3	0.0043	0.0102	0.0064	3	3	100.0	
RANGE (M)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0	-----	-----	-----	0	3	0.0	

COMBINED STATISTICS SUMMARY FOR MILA

STATION = WL2F  
 SATELLITE = ISS  
 SATELLITE = STS-119

## RESIDUALS

	MEAN	DEV	SD	RSS	PTS	PASSES
ANGLE 1 (DEG)	0.003	0.007	0.013	0.014	877	18
ANGLE 2 (DEG)	0.000	0.015	0.014	0.016	877	18
RANGE (M)	3.030	11.796	13.263	14.828	877	18
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0

COMBINED STATISTICS SUMMARY FOR WL2F

## VDNA NOISE

	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.0053	0.0226	0.0110	18	18	100.0	
ANGLE 2 (DEG)	0.0033	0.0221	0.0108	18	18	100.0	
RANGE (M)	2.9716	16.5704	10.2425	18	18	100.0	
RANGE-RATE (M/S)	-----	-----	-----	0	18	0.0	

## RATING

STATION = WLPQ

SATELLITE = ISS

SATELLITE = STS-119

## RESIDUALS

	MEAN	DEV	SD	RSS	PTS	PASSES
ANGLE 1 (DEG)	-0.001	0.003	0.004	0.004	512	11
ANGLE 2 (DEG)	0.008	0.008	0.004	0.009	515	11
RANGE (M)	-0.013	10.595	14.153	15.112	515	11
RANGE-RATE (M/S)	-----	-----	-----	-----	0	0

COMBINED STATISTICS SUMMARY FOR WLPQ

## VDNA NOISE

	MIN	MAX	RMS	PASSES	TOTALPASSES	%USE	ANOMALY
ANGLE 1 (DEG)	0.0008	0.0031	0.0022	11	11	100.0	
ANGLE 2 (DEG)	0.0008	0.0031	0.0018	11	11	100.0	
RANGE (M)	2.0693	13.9374	9.7528	11	11	98.3	
RANGE-RATE (M/S)	-----	-----	-----	0	11	0.0	

## RATING

## **11. SN EVENT SUMMARY REPORT**

The SN Event Summary Report provides a detailed summary of the tracking data quality of each SN tracking data event for STS. This report gives a chronological listing of all STS SN events summarized by Tracking Data Relay Satellite (TDRS) used for each event. The start and stop time, as well as other information pertaining to data quality such as the number of invalid, anomalous, and usable frames of tracking data, are listed for each event. Each event is rated as either a success or a failure. Comments are included for significant anomalous tracking data or for events having more than 30% invalid tracking data. This report also includes a statistical summary regarding the overall tracking data quality for all events for each TDRS used for STS support. This report is generated after the launch of STS.

```
TEAS  
TEAS  
TEAS  
TEAS TRACKING EVALUATION AUTOMATION SOFTWARE (TEAS)  
TEAS ALLIED SIGNAL TECHNICAL SERVICES CORPORATION  
TEAS TRACKING SUPPORT SERVICES (TSS)  
TEAS GODDARD SPACE FLIGHT CENTER  
TEAS BUILDING 28, ROOM N230  
TEAS GARY W. WILLIAMSON  
TEAS (301) 286-1323 PHONE  
TEAS  
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TEAS TEAS TEAS TEAS TEAS TEAS TEAS TEAS TEAS TEAS TEAS TEAS  
1 #####  
# Daily Statistics Start: 20090317/224051 GMT #  
# Daily Statistics End: 20090318/231018 GMT #  
# Mission Statistics Start: 20090314/000000 GMT #  
# Mission Statistics End: 20090318/231018 GMT #  
# Report Generated on: 20090318/233606 GMT #  
# Report Generated by: Gary Williamson (301) 286-1323 #  
#####  
1 STS-119 TDRS- 3 EVENT TRACKING SUMMARY LOG  
REPORT GENERATION TIME: 20090318/233606 GMT  
  
S  
EVT ORBIT TDRS- 3 AOS LOS D E G D O P P L E R GSTDN MODE NOISE  
NUM NUMBER MMDD/HHMMSS HHMMSS C RET Q L PRED INV ANM USE DCE NL TOT DCE NL MIL USE  
PTS HZ % F COMMENTS  
2 1 0316/000345 003625 10 SSA1 A 3 197 90 2 105 192 65 0 0 0 11 53 F 46% invalid Doppler, no lock = 33%  
5 2 0316/015606 020746 10 SSA1 A 3 71 6 0 65 71 1 0 0 0 9 92  
8 3 0316/031024 033934 10 SSA1 A 3 170 4 0 166 170 1 0 0 0 9 98  
24 11 0316/143922 144902 10 SSA2 A 3 59 6 0 53 58 2 0 0 0 7 90
```

27	11,12	0316/155354	163034	10	SSA1	A	3	221	2	0	219	221	0	0	0	0	11	99	
34	15	0316/204852	210802	10	SSA1	A	3	116	45	18	53	113	20	0	0	0	6	46	F 39% invalid Doppler, no lock = 17%
38	16	0316/222239	224639	10	SSA1	A	3	145	13	18	114	143	6	0	0	0	8	79	
59	25,26	0317/123547	131507	10	SSA1	A	3	237	17	0	220	235	4	0	0	0	8	93	
62	27	0317/143808	144118	10	SSA1	A	3	20	3	0	17	19	1	0	0	0	7	85	
65	27,28	0317/154658	161518	10	SSA1	A	3	171	0	0	171	171	0	0	0	0	8	100	
68	29	0317/174429	175039	10	SSA1	A	3	38	2	0	36	38	1	0	0	0	5	95	
71	30	0317/192057	192757	10	SSA1	A	3	43	2	0	41	43	0	0	0	0	7	95	
75	31	0317/205714	210724	10	SSA1	A	3	62	4	2	56	61	1	0	0	0	7	90	
78	32	0317/222611	225951	10	SSA1	A	3	204	5	2	197	204	0	0	0	0	5	97	
81	33	0318/001431	002621	10	SSA1	A	3	72	2	0	70	72	0	0	0	0	5	97	
99	40,41	0318/113930	120300	10	SSA1	A	3	142	2	0	140	142	0	0	0	0	7	99	
104	43	0318/145825	150515	10	SSA1	A	3	42	0	0	42	42	0	0	0	0	8	100	
107	44	0318/163534	163904	10	SSA1	A	3	22	0	0	22	22	0	0	0	0	7	100	
110	45	0318/181523	181803	10	SSA1	A	3	17	0	0	17	17	17	0	0	0	0	100	
113	46	0318/194811	201651	10	SSA1	A	3	173	2	0	171	172	1	0	0	0	8	99	
116	47	0318/212520	215300	10	SSA1	A	3	168	6	3	159	168	1	0	0	0	7	95	
119	48	0318/230029	231019	10	SSA1	A	3	60	2	0	58	60	0	0	0	0	6	97	

1 STS-119 TDRS- 4 EVENT TRACKING SUMMARY LOG  
REPORT GENERATION TIME: 20090318/233606 GMT

EVT NUM NUMBER	ORBIT	S												COMMENTS					
		D	E	G	D	O	P	P	L	E	R	GSTDN	MODE		NOISE				
TDRS-	4	AOS	LOS	C	RET	Q	L	PRED	INV	ANM	USE	DCE	NL	TOT	DCE	NL	MIL	USE	
MMDD/HHMMSS	HHMMSS	I	SERV	P	T	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	HZ	%	F
1	1	0315/234355	001855	10	SSA2	B	1	211	52	0	159	202	36	0	0	0	25	75	
4	2	0316/012447	015507	10	SSA2	B	1	183	2	1	180	182	1	0	0	0	4	98	
7	3	0316/023957	030947	10	SSA2	B	1	180	3	0	177	180	1	0	0	0	8	98	
10	4	0316/043202	050632	10	SSA2	B	1	208	5	1	202	206	2	0	0	0	3	97	
14	6	0316/074135	081435	10	SSA2	B	1	199	25	17	157	197	9	0	0	0	4	79	
16	7	0316/091837	094857	10	SSA2	B	1	183	18	11	154	181	5	0	0	0	3	84	
18	8	0316/105602	112412	10	SSA2	B	1	170	6	2	162	169	1	0	0	0	3	95	
20	9	0316/123201	130121	10	SSA2	B	1	177	9	5	163	177	0	0	0	0	3	92	
23	10,11	0316/140556	143846	10	SSA2	B	1	198	5	0	193	197	1	0	0	0	5	97	
26	11	0316/154025	155315	10	SSA2	B	1	78	7	0	71	78	2	0	0	0	0	91	
29	12,13	0316/171401	174931	10	SSA2	B	1	214	10	8	196	213	4	0	0	0	5	92	
31	13,14	0316/183308	192318	10	SSA2	B	1	302	3	0	299	302	0	0	0	0	3	99	
33	14,15	0316/202003	204813	10	SSA2	B	1	170	3	0	167	169	1	0	0	0	3	98	
37	16	0316/220216	222206	10	SSA2	B	1	120	0	0	120	120	0	0	0	0	4	100	
41	17	0316/233940	000830	10	SSA2	B	1	174	6	0	168	173	3	0	0	0	5	97	
43	17,18	0317/005240	014600	10	SSA2	B	1	321	5	1	315	321	1	0	0	0	4	98	
45	19	0317/023019	032249	10	SSA2	B	1	316	7	5	304	316	0	0	0	0	4	96	
47	20	0317/040700	045810	10	SSA2	B	1	308	12	3	293	308	3	0	0	0	4	95	
49	21	0317/055800	063220	10	SSA2	B	1	207	4	0	203	206	2	0	0	0	2	98	
51	22	0317/071621	080621	10	SSA2	B	1	301	64	56	181	297	25	0	0	0	3	60	F 21% invalid Doppler, no lock = 8%
54	23	0317/091001	094101	10	SSA2	B	1	187	25	10	152	186	3	0	0	0	3	81	
56	24	0317/104834	111004	10	SSA2	B	1	130	10	0	120	130	1	0	0	0	5	92	

58	25	0317/122428	123508	10	SSA2	B	1	65	2	0	63	65	0	0	0	0	7	97
61	26	0317/135840	141000	10	SSA2	B	1	69	15	5	49	68	1	0	0	0	5	71
64	27	0317/151549	154619	10	SSA2	B	1	184	4	0	180	184	1	0	0	0	4	98
67	28,29	0317/170847	174357	10	SSA2	B	1	212	8	24	180	212	0	0	0	0	5	85
70	29,30	0317/184630	192010	10	SSA2	B	1	203	47	22	134	201	22	0	0	0	4	66 F 23% invalid Doppler, no lock = 11%
74	30,31	0317/200329	205639	10	SSA2	B	1	320	12	3	305	319	1	0	0	0	9	95
77	32	0317/220550	222540	10	SSA2	B	1	120	2	0	118	120	1	0	0	0	3	98
80	33	0317/234436	001356	10	SSA2	B	1	177	27	3	147	175	4	0	0	0	3	83
83	34	0318/011909	015359	10	SSA2	B	1	210	38	2	170	207	12	0	0	0	4	81
85	35	0318/025719	033159	10	SSA2	B	1	209	0	0	209	209	0	0	0	0	3	100
87	36	0318/041556	050936	10	SSA2	B	1	323	36	4	283	320	16	0	0	0	3	88
89	37	0318/055257	064547	10	SSA2	B	1	318	25	18	275	316	8	0	0	0	3	86
91	38	0318/072914	082214	10	SSA2	B	1	319	16	23	280	318	3	0	0	0	3	88
95	39	0318/091113	095943	10	SSA2	B	1	292	4	0	288	292	0	0	0	0	3	99
98	40	0318/110935	113855	10	SSA2	B	1	177	0	0	177	177	0	0	0	0	2	100
101	41,42	0318/123911	131901	10	SSA2	B	1	240	2	4	234	240	0	0	0	0	2	98
103	42,43	0318/142300	145750	10	SSA2	B	1	210	1	0	209	210	0	0	0	0	3	100
106	43,44	0318/155111	163501	10	SSA2	B	1	264	0	0	264	264	0	0	0	0	2	100
109	44,45	0318/172741	181121	10	SSA2	B	1	263	0	0	263	263	0	0	0	0	3	100
112	45,46	0318/190141	194731	10	SSA2	B	1	276	11	11	254	274	2	0	0	0	3	92
115	46,47	0318/204431	212441	10	SSA2	B	1	242	7	0	235	241	1	0	0	0	3	97
118	48	0318/223446	225956	10	SSA2	B	1	152	3	0	149	150	2	0	0	0	3	98

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STS-119 TDRS- 5 EVENT TRACKING SUMMARY LOG  
REPORT GENERATION TIME: 20090318/233606 GMT

EVT NUM NUMBER	ORBIT	S												COMMENTS				
		D	E	G	D	O	P	P	L	E	R	GSTDN	MODE		NOISE			
TDRS- 5	AOS	LOS	C	RET	Q	L	PRED	INV	ANM	USE	DCE	NL	TOT	DCE	NL	MIL	USE	
MMDD/HHMMSS	HHMMSS	I	SERV	P	T	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	PTS	HZ	%	F
3	1,2	0316/003430	012410	10	SSA2	B	2	299	6	0	293	299	0	0	0	0	6	98
6	2,3	0316/020828	023918	10	SSA2	B	2	186	27	19	140	183	7	0	0	0	7	75
9	3,4	0316/034105	043015	10	SSA2	B	2	296	41	28	227	292	28	0	0	0	4	77
11	4,5	0316/051450	060540	10	SSA2	B	2	306	18	8	280	305	5	0	0	0	3	92
13	5,6	0316/064906	073616	10	SSA2	B	2	284	3	3	278	283	1	0	0	0	3	98
15	6,7	0316/082442	091612	10	SSA2	B	2	310	2	0	308	310	0	0	0	0	5	99
17	7,8	0316/100159	105529	10	SSA2	B	2	322	0	3	319	322	0	0	0	0	4	99
19	9	0316/113921	123121	10	SSA2	B	2	313	4	2	307	313	1	0	0	0	4	98
21	10	0316/131513	133823	10	SSA2	B	2	140	3	1	136	139	1	0	0	0	4	97
25	11	0316/144936	153946	10	SSA2	B	2	302	31	12	259	298	15	0	0	0	0	86
28	12	0316/163109	171329	10	SSA2	B	2	255	7	16	232	254	1	0	0	0	5	91
30	13	0316/175731	183231	10	SSA2	B	2	211	12	24	175	208	4	0	0	0	5	83
32	14	0316/193240	201930	10	SSA2	B	2	282	2	0	280	282	0	0	0	0	2	99
35	15	0316/210930	213710	10	SSA2	B	2	167	3	2	162	167	0	0	0	0	3	97
39	16	0316/224710	231450	10	SSA2	B	2	167	2	0	165	166	1	0	0	0	2	99
42	17	0317/002333	005203	10	SSA2	B	2	172	3	2	167	172	0	0	0	0	2	97
44	18,19	0317/015823	022943	10	SSA2	B	2	189	38	15	136	185	12	0	0	0	7	72
46	19,20	0317/033221	040621	10	SSA2	B	2	205	27	5	173	203	14	0	0	0	4	84

48	20,21	0317/050616	055726	10	SSA2	B	2	308	10	0	298	307	4	0	0	0	4	97
50	21,22	0317/064051	071541	10	SSA2	B	2	210	2	0	208	210	0	0	0	0	4	99
52	22,23	0317/082119	085329	10	SSA2	B	2	194	2	0	192	194	1	0	0	0	4	99
55	24	0317/095639	104759	10	SSA2	B	2	309	5	1	303	309	0	0	0	0	3	98
57	25	0317/113431	122341	10	SSA2	B	2	296	0	0	296	295	1	0	0	0	4	100
60	26	0317/131539	135809	10	SSA2	B	2	256	7	1	248	254	3	0	0	0	4	97
63	27	0317/144154	151514	10	SSA2	B	2	201	4	0	197	201	0	0	0	0	5	98
66	28	0317/161551	170801	10	SSA2	B	2	314	22	4	288	311	5	0	0	0	7	92
69	29	0317/175110	184540	10	SSA2	B	2	328	8	1	319	328	3	0	0	0	5	97
72	30	0317/192829	200029	10	SSA2	B	2	193	3	0	190	193	0	0	0	0	3	98
73	30	0317/200106	200256	10	SSA1	A	2	12	2	0	10	12	0	0	0	0	4	83
76	31,32	0317/210820	220510	10	SSA2	B	2	342	105	17	220	335	41	0	0	0	8	64 F 31% invalid Doppler, no lock = 12%
79	32,33	0317/230031	234341	10	SSA2	B	2	260	8	0	252	258	3	0	0	0	3	97
82	33,34	0318/003555	011835	10	SSA2	B	2	257	3	0	254	257	0	0	0	0	3	99
84	34,35	0318/020330	025640	10	SSA2	B	2	320	21	12	287	318	13	0	0	0	2	90
86	35,36	0318/033944	041524	10	SSA2	B	2	215	30	9	176	214	14	0	0	0	3	82
88	36,37	0318/051606	055226	10	SSA2	B	2	219	26	8	185	217	16	0	0	0	3	84
90	37,38	0318/065331	072841	10	SSA2	B	2	212	49	16	147	209	35	0	0	0	3	69 F 23% invalid Doppler, no lock = 17%
92	38,39	0318/083248	084828	10	SSA1	A	2	95	83	9	3	89	59	0	0	0	0	3 F 87% invalid Doppler, no lock = 62%
93	39	0318/084902	090452	10	SSA2	B	2	96	17	5	74	96	6	0	0	0	3	77
96	40	0318/101303	102613	10	SSA1	A	2	80	41	17	22	76	21	0	0	0	10	28 F 51% invalid Doppler, no lock = 26%
97	40	0318/102650	110900	10	SSA2	B	2	254	3	0	251	253	1	0	0	0	3	99
100	41	0318/120331	123831	10	SSA2	B	2	211	2	0	209	211	0	0	0	0	3	99
102	42	0318/132910	142220	10	SSA2	B	2	320	20	11	289	315	9	0	0	0	3	90
105	43	0318/150548	155038	10	SSA2	B	2	270	19	10	241	268	11	0	0	0	3	89
108	44	0318/164144	172704	10	SSA2	B	2	273	16	19	238	273	5	0	0	0	2	87
111	45	0318/181850	190110	10	SSA2	B	2	255	41	5	209	253	21	0	0	0	2	82
114	46	0318/201731	204351	10	SSA2	B	2	159	1	0	158	159	0	0	0	0	3	99
117	47,48	0318/215331	223411	10	SSA2	B	2	245	10	2	233	244	3	0	0	0	3	95

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STS-119 TDRS- 6 EVENT TRACKING SUMMARY LOG  
REPORT GENERATION TIME: 20090318/233606 GMT

EVT	ORBIT	S										COMMENTS						
		D	E	G	D	O	P	P	L	E	R		GSTDN	MODE	NOISE			
NUM	MMDD	HHMMSS	I	SERV	P	T	PTS	PTS	PTS	PTS	NL	TOT	DCE	NL	MIL	USE	F	
22	10	0316/134331	140511	10	SSA1	A	1	131	1	2	128	131	0	0	0	0	3	98
36	15,16	0316/213749	220139	10	SSA1	A	1	144	3	0	141	144	0	0	0	0	3	98
40	16,17	0316/231523	233903	10	SSA1	A	1	143	7	1	135	141	4	0	0	0	3	94
53	23	0317/085401	090921	10	SSA1	A	1	93	0	1	92	93	0	0	0	0	11	99

1

STS-119 TDRS-10 EVENT TRACKING SUMMARY LOG  
REPORT GENERATION TIME: 20090318/233606 GMT

EVT	ORBIT	S																
		D	E	G	D	O	P	P	L	E	R		GSTDN	MODE	NOISE			
NUM	MMDD	HHMMSS	I	SERV	P	T	PTS	PTS	PTS	PTS	NL	TOT	DCE	NL	MIL	USE		
22	10	0316/134331	140511	10	SSA1	A	1	131	1	2	128	131	0	0	0	0	3	98
36	15,16	0316/213749	220139	10	SSA1	A	1	144	3	0	141	144	0	0	0	0	3	98
40	16,17	0316/231523	233903	10	SSA1	A	1	143	7	1	135	141	4	0	0	0	3	94
53	23	0317/085401	090921	10	SSA1	A	1	93	0	1	92	93	0	0	0	0	11	99

NUM NUMBER	MMDD/HHMMSS	HHMMSS	I	SERV	P	T	PTS	HZ	%	F	COMMENTS						
12 5	0316/060612	063922	10	SSA1	A	2	200	2	0	198	200	0	0	0	3	99	
94 39	0318/090528	091038	10	SSA1	B	2	32	25	7	0	31	11	0	0	0	0	78% invalid Doppler, no lock = 34%

1  
STS-119 TDRS- 3 TRACKING DATA DAILY REPORT FOR DAY 3

REPORT GENERATION TIME: 20090318/233606 GMT

DAILY EVENTS: 81 TO 119 FROM 20090318/001431 TO 20090318/231019 GMT

MISSION EVENTS: 2 TO 119 FROM 20090316/000345 TO 20090318/231019 GMT

	DAILY	MISSION
# OF EVENTS	8	22
# OF SUCCESSES	8	20
% SUCCESSES	100.0	90.9
# OF USABLE MINUTES	113.2	365.3
# OF ANOMALOUS MINUTES	0.5	7.5
# OF INVALID MINUTES	2.3	35.5
# OF TOTAL MINUTES	116.0	408.3
AV. USABLE MINUTES	14.1	16.6
AV. ANOMALOUS MINUTES	0.1	0.3
AV. INVALID MINUTES	0.3	1.6
AV. MINUTES PER EVENT	14.5	18.6
% USABLE	97.6	89.5
% ANOMALOUS	0.4	1.8
% INVALID	2.0	8.7

NO EVENTS WERE RATED AS FAILURES FOR TDRS- 3.

1  
STS-119 TDRS- 4 TRACKING DATA DAILY REPORT FOR DAY 3

REPORT GENERATION TIME: 20090318/233606 GMT

DAILY EVENTS: 80 TO 118 FROM 20090317/234436 TO 20090318/225956 GMT

MISSION EVENTS: 1 TO 118 FROM 20090315/234355 TO 20090318/225956 GMT

	DAILY	MISSION
# OF EVENTS	15	44
# OF SUCCESSES	15	42
% SUCCESSES	100.0	95.5
# OF USABLE MINUTES	572.8	1433.7
# OF ANOMALOUS MINUTES	10.8	39.8
# OF INVALID MINUTES	28.3	90.2
# OF TOTAL MINUTES	612.0	1563.7
AV. USABLE MINUTES	38.2	32.6
AV. ANOMALOUS MINUTES	0.7	0.9
AV. INVALID MINUTES	1.9	2.0
AV. MINUTES PER EVENT	40.8	35.5
% USABLE	93.6	91.7
% ANOMALOUS	1.8	2.5

% INVALID 4.6 5.8

NO EVENTS WERE RATED AS FAILURES FOR TDRS- 4.

1

STS-119 TDRS- 5 TRACKING DATA DAILY REPORT FOR DAY 3  
REPORT GENERATION TIME: 20090318/233606 GMT  
DAILY EVENTS: 79 TO 117 FROM 20090317/230031 TO 20090318/223411 GMT  
MISSION EVENTS: 3 TO 117 FROM 20090316/003430 TO 20090318/223411 GMT

	DAILY	MISSION
# OF EVENTS	17	47
# OF SUCCESSES	14	43
% SUCCESSES	82.4	91.5
# OF USABLE MINUTES	538.0	1672.3
# OF ANOMALOUS MINUTES	20.5	47.8
# OF INVALID MINUTES	65.0	131.5
# OF TOTAL MINUTES	623.5	1851.7
AV. USABLE MINUTES	31.6	35.6
AV. ANOMALOUS MINUTES	1.2	1.0
AV. INVALID MINUTES	3.8	2.8
AV. MINUTES PER EVENT	36.7	39.4
% USABLE	86.3	90.3
% ANOMALOUS	3.3	2.6
% INVALID	10.4	7.1

THE FOLLOWING DAILY EVENTS WERE RATED AS FAILURES FOR TDRS- 5:

EVT YYYYMMDD/HHMMSS SERV	COMMENT
90 20090318/065331 SSA2	23% invalid Doppler, no lock = 17%
92 20090318/083248 SSA1	87% invalid Doppler, no lock = 62%
96 20090318/101303 SSA1	51% invalid Doppler, no lock = 26%

1

STS-119 TDRS- 6 TRACKING DATA DAILY REPORT FOR DAY 3  
REPORT GENERATION TIME: 20090318/233606 GMT  
DAILY EVENTS: 0 TO 0 FROM 0/000000 TO 0/000000 GMT  
MISSION EVENTS: 22 TO 53 FROM 20090316/134331 TO 20090317/090921 GMT

	DAILY	MISSION
# OF EVENTS	0	4
# OF SUCCESSES	0	4
% SUCCESSES	0.0	100.0
# OF USABLE MINUTES	0.0	82.7
# OF ANOMALOUS MINUTES	0.0	0.7
# OF INVALID MINUTES	0.0	1.8
# OF TOTAL MINUTES	0.0	85.2

AV. USABLE MINUTES	0.0	20.7
AV. ANOMALOUS MINUTES	0.0	0.2
AV. INVALID MINUTES	0.0	0.5
AV. MINUTES PER EVENT	0.0	21.3
% USABLE	0.0	97.1
% ANOMALOUS	0.0	0.8
% INVALID	0.0	2.2

NO EVENTS WERE RATED AS FAILURES FOR TDRS- 6.

1

STS-119 TDRS-10 TRACKING DATA DAILY REPORT FOR DAY 3  
 REPORT GENERATION TIME: 20090318/233606 GMT  
 DAILY EVENTS: 94 TO 94 FROM 20090318/090528 TO 20090318/091038 GMT  
 MISSION EVENTS: 12 TO 94 FROM 20090316/060612 TO 20090318/091038 GMT

	DAILY	MISSION
# OF EVENTS	1	2
# OF SUCCESSES	0	1
% SUCCESSES	0.0	50.0
# OF USABLE MINUTES	0.0	33.0
# OF ANOMALOUS MINUTES	1.2	1.2
# OF INVALID MINUTES	4.2	4.5
# OF TOTAL MINUTES	5.3	38.7
AV. USABLE MINUTES	0.0	16.5
AV. ANOMALOUS MINUTES	1.2	0.6
AV. INVALID MINUTES	4.2	2.3
AV. MINUTES PER EVENT	5.3	19.3
% USABLE	0.0	85.3
% ANOMALOUS	21.9	3.0
% INVALID	78.1	11.6

THE FOLLOWING DAILY EVENTS WERE RATED AS FAILURES FOR TDRS-10:

EVT	YYYYMMDD/HHMMSS	SERV	COMMENT
94	20090318/090528	SSA1	78% invalid Doppler, no lock = 34%
1	59811	STS119dc000	20090315/232805 4 0315/234355 001855
2	59845	STS119dc001	20090315/234112 3 0316/000345 003625
3	59814	STS119dc001	20090315/234112 5 0316/003430 012410
4	59815	STS119dc001	20090315/234112 4 0316/012447 015507
5	59826	STS119dc002	20090316/104110 3 0316/015606 020746
6	59822	STS119dc002	20090316/104110 5 0316/020828 023918
7	59823	STS119dc002	20090316/104110 4 0316/023957 030947
8	59846	STS119dc003	20090316/110408 3 0316/031024 033934
9	59829	STS119dc003	20090316/110408 5 0316/034105 043015
10	59830	STS119dc003	20090316/110408 4 0316/043202 050632

11	59831	STS119dc003	20090316/110408	5	0316/051450	060540
12	59832	STS119dc003	20090316/110408	10	0316/060612	063922
13	59833	STS119dc004	20090316/110442	5	0316/064906	073616
14	59834	STS119dc004	20090316/110442	4	0316/074135	081435
15	59835	STS119dc005	20090316/110514	5	0316/082442	091612
16	59836	STS119dc005	20090316/110514	4	0316/091837	094857
17	59837	STS119dc006	20090316/110546	5	0316/100159	105529
18	59838	STS119dc006	20090316/110546	4	0316/105602	112412
19	59839	STS119dc007	20090316/110623	5	0316/113921	123121
20	59840	STS119dc007	20090316/110623	4	0316/123201	130121
21	59841	STS119dc007	20090316/110623	5	0316/131513	133823
22	59842	STS119dc007	20090316/110623	6	0316/134331	140511
23	59843	STS119dc007	20090316/110623	4	0316/140556	143846
24	59945	STS119dc008	20090316/175751	3	0316/143922	144902
25	59942	STS119dc008	20090316/175751	5	0316/144936	153946
26	59943	STS119dc008	20090316/175751	4	0316/154025	155315
27	59947	STS119dc008	20090316/174042	3	0316/155354	163034
28	59939	STS119dc008	20090316/174042	5	0316/163109	171329
29	59940	STS119dc008	20090316/174042	4	0316/171401	174931
30	59925	STS119dc009	20090316/152857	5	0316/175731	183231
31	59926	STS119dc009	20090316/152857	4	0316/183308	192318
32	59927	STS119dc010	20090316/170433	5	0316/193240	201930
33	59928	STS119dc010	20090316/170433	4	0316/202003	204813
34	59953	STS119dc011	20090316/184058	3	0316/204852	210802
35	59949	STS119dc011	20090316/184058	5	0316/210930	213710
36	59950	STS119dc011	20090316/184058	6	0316/213749	220139
37	59951	STS119dc011	20090316/184058	4	0316/220216	222206
38	60264	STS119dc012	20090316/202138	3	0316/222239	224639
39	60132	STS119dc012	20090316/202138	5	0316/224710	231450
40	60133	STS119dc012	20090316/202138	6	0316/231523	233903
41	60134	STS119dc012	20090316/202138	4	0316/233940	000830
42	60265	STS119dc013	20090316/215506	5	0317/002333	005203
43	60266	STS119dc013	20090316/215506	4	0317/005240	014600
44	60267	STS119dc014	20090316/232943	5	0317/015823	022943
45	60268	STS119dc014	20090316/232943	4	0317/023019	032249
46	60269	STS119dc015	20090317/010454	5	0317/033221	040621
47	60270	STS119dc015	20090317/010454	4	0317/040700	045810
48	60271	STS119dc016	20090317/023709	5	0317/050616	055726
49	60272	STS119dc016	20090317/023709	4	0317/055800	063220
50	60273	STS119dc017	20090317/041232	5	0317/064051	071541
51	60274	STS119dc017	20090317/041232	4	0317/071621	080621
52	60275	STS119dc018	20090317/054934	5	0317/082119	085329
53	60276	STS119dc018	20090317/054934	6	0317/085401	090921
54	60277	STS119dc018	20090317/054934	4	0317/091001	094101
55	60280	STS119dc019	20090317/072511	5	0317/095639	104759
56	60281	STS119dc019	20090317/072511	4	0317/104834	111004
57	60284	STS119dc020	20090317/090249	5	0317/113431	122341
58	60285	STS119dc020	20090317/090249	4	0317/122428	123508

59	60363	STS119dc021	20090317/104230	3	0317/123547	131507
60	60288	STS119dc021	20090317/104230	5	0317/131539	135809
61	60289	STS119dc021	20090317/104230	4	0317/135840	141000
62	60291	STS119dc022	20090317/121424	3	0317/143808	144118
63	60292	STS119dc022	20090317/121424	5	0317/144154	151514
64	60293	STS119dc022	20090317/121424	4	0317/151549	154619
65	60370	STS119dc023	20090317/185801	3	0317/154658	161518
66	60374	STS119dc023	20090317/190706	5	0317/161551	170801
67	60372	STS119dc023	20090317/190706	4	0317/170847	174357
68	60377	STS119dc024	20090317/192427	3	0317/174429	175039
69	60381	STS119dc024	20090317/193052	5	0317/175110	184540
70	60379	STS119dc024	20090317/193052	4	0317/184630	192010
71	60387	STS119dc025	20090317/194303	3	0317/192057	192757
72	60383	STS119dc025	20090317/194303	5	0317/192829	200029
73	60384	STS119dc025	20090317/194303	5	0317/200106	200256
74	60385	STS119dc025	20090317/194303	4	0317/200329	205639
75	60388	STS119dc026	20090317/184420	3	0317/205714	210724
76	60365	STS119dc026	20090317/184420	5	0317/210820	220510
77	60366	STS119dc026	20090317/184420	4	0317/220550	222540
78	60706	STS119dc027	20090317/202436	3	0317/222611	225951
79	60555	STS119dc027	20090317/202436	5	0317/230031	234341
80	60556	STS119dc027	20090317/202436	4	0317/234436	001356
81	60710	STS119dc028	20090317/220132	3	0318/001431	002621
82	60708	STS119dc028	20090317/220132	5	0318/003555	011835
83	60709	STS119dc028	20090317/220132	4	0318/011909	015359
84	60711	STS119dc029	20090317/234143	5	0318/020330	025640
85	60712	STS119dc029	20090317/234143	4	0318/025719	033159
86	60713	STS119dc030	20090318/011729	5	0318/033944	041524
87	60714	STS119dc030	20090318/011729	4	0318/041556	050936
88	60715	STS119dc031	20090318/025336	5	0318/051606	055226
89	60716	STS119dc031	20090318/025336	4	0318/055257	064547
90	60717	STS119dc032	20090318/043002	5	0318/065331	072841
91	60718	STS119dc032	20090318/043002	4	0318/072914	082214
92	60719	STS119dc033	20090318/060638	5	0318/083248	084828
93	60720	STS119dc033	20090318/060638	5	0318/084902	090452
94	60721	STS119dc033	20090318/060638	10	0318/090528	091038
95	60722	STS119dc033	20090318/060638	4	0318/091113	095943
96	60723	STS119dc034	20090318/074715	5	0318/101303	102613
97	60724	STS119dc034	20090318/074715	5	0318/102650	110900
98	60725	STS119dc034	20090318/074715	4	0318/110935	113855
99	60743	STS119dc035	20090318/092652	3	0318/113930	120300
100	60728	STS119dc035	20090318/092652	5	0318/120331	123831
101	60729	STS119dc035	20090318/092652	4	0318/123911	131901
102	60730	STS119dc036	20090318/112141	5	0318/132910	142220
103	60731	STS119dc036	20090318/112141	4	0318/142300	145750
104	60744	STS119dc037	20090318/124218	3	0318/145825	150515
105	60734	STS119dc037	20090318/124218	5	0318/150548	155038
106	60735	STS119dc037	20090318/124218	4	0318/155111	163501

107	60736	STS119dc037	20090318/124218	3	0318/163534	163904
108	60741	STS119dc038	20090318/170938	5	0318/164144	172704
109	60742	STS119dc038	20090318/170938	4	0318/172741	181121
110	60737	STS119dc039	20090318/155315	3	0318/181523	181803
111	60738	STS119dc039	20090318/155315	5	0318/181850	190110
112	60739	STS119dc039	20090318/155315	4	0318/190141	194731
113	60749	STS119dc040	20090318/173213	3	0318/194811	201651
114	60746	STS119dc040	20090318/173213	5	0318/201731	204351
115	60747	STS119dc040	20090318/173213	4	0318/204431	212441
116	60754	STS119dc041	20090318/191056	3	0318/212520	215300
117	60751	STS119dc041	20090318/191056	5	0318/215331	223411
118	60752	STS119dc041	20090318/191056	4	0318/223446	225956
119	60753	STS119dc041	20090318/191056	3	0318/230029	231019